Creating Application Icons With Icon
By Martin Frauendorf

Introduction

Icon is an application, if one dare call anything in /NextDeveloper/Demos an application, bundled with every NeXT machine. Its author, Keith Ohlfs, describes Icon as "...a tool for editing bitmap images on the NeXT computer." However, help for Icon is fairly non-existent and Keith's help panel comment that Icon is best learned through trial and error does little to inspire confidence, either in experienced users or NeXT neophytes. Unfortunately, this has led to a severe under-utilization of Icon, which with a little patience and experimentation, can be tamed.

Icon is a powerful application with a cornucopia of features involving anything from text manipulation to the editing and animation of bitmaps. This article will simply be an introduction to using Icon as a tool for creating Icons, either from scratch or by modifying existing ones, for use as application or button icons.

Icon Panels

There are several panels in Icon which you need to be familiar with in order to create an icon. They are the Tool Panel, the Inspector Panel, the Colour Panel, and the Detail Panel.

Tool Panel

The Tool Panel is used to select various drawing and selection tools (see figure 1) and is brought up by selecting the "Tools->Tools..." menu item. It also appears when you first launch Icon. This panel allows you, for instance, to select between a pencil tool, a line tool, and a selection rectangle tool.

Inspector Panel

The Inspector panel is brought up with the "Tools->Inspector..." menu item and is mostly used to change the attributes of the various drawing tools. It has a few other guises as well which can be selected by dragging on the pull-down menu currently labelled as "Tool Inspector" at the top of the panel. We will limit ourselves to the "Tool Inspector" and "Image Info" faces of this panel. You would use this panel to change the width of the line drawn by the pencil tool or resize a part of an image selected with the selection tool. Note that the contents of the Inspector Panel change as you select various tools from the Tool Panel. In order to resize the image window, you need to use the "Image Info" pull-down menu item and edit the width and height fields.to set its width and height (see figure 2).

Selection Tool Inspector

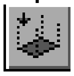
See figure 3 for the Tool Inspector for the selection tool (also known as a marquee or lasso). This panel is particularly useful in manipulating icons yet is one of the more cryptic panels in Icon. As it turns out, the standard cut/copy/paste operations don't work quite as expected in Icon. They seem to only operate within the confines of a selection rectangle; i.e. paste won't modify your image; it'll only paste a copy of what you cut/copied into the selection rectangle. Instead, you must use the Marquee/Lasso options in the inspector panel for the selection tool. I'll explain the meanings (well, most of them) of the Marquee/Lasso Option icons (see figure 4) from left to right, top to bottom.

Selection Tool Operations

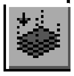
The first is a cut operation

which removes the contents of the selection rectangle from your image. The second one is a copy operation

which makes a copy of the selection rectangle. It should be noted that this is the default operation of the selection tool; i.e. dragging out a selection rectangle makes a copy of your image enclosed by the selection rectangle which can then be positioned by clicking within the selection rectangle and then dragging. The third icon represents a paste operation

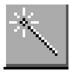


which pastes the contents of the selection rectangle onto your image. Be aware that after you have pasted the selection rectangle, the selection rectangle is still visible and can be removed by simple clicking somewhere outside of the selection rectangle. The results of the paste operation are then visible. The fourth icon

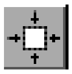


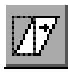
is used in creating animated bitmaps which is beyond the scope of this article. The fifth icon represents a fill operation

which fills the selection rectangle with the current colour. The sixth icon (some sort of magic wand)

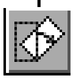


is still a mystery to me.

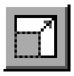
Now onto the second row of icons. The first one 
seems to have no effect, so I'll ignore it. The second icon represents a shearing tool;



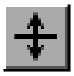
i.e. it translates the vertical coordinates of the selection rectangle by an amount proportional to their horizontal coordinates. The third icon represents a rotation of the selection rectangle.

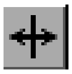


The fourth icon represents a scaling operation,



the fifth a flip (or mirror image) about the horizontal axis,



and the sixth a flip about the vertical axis. 

Other functions available from the selection tool inspector are the movement of the selection rectangle in pixel increments, replacing a selected colour with another one, and affecting the transparency of the contents of the selection rectangle.

Colour Panel

The Colour Panel is brought up with the "Tools->Colors..." menu item (see figure 5). This panel allows you to work in a number of colour selection models such as NeXT's colour picker, grayscale, or RGB and to set the current drawing colour. It should be noted that colour includes NeXT's alpha channel or transparency. The effect of a particular transparency value depends on the compositing operator used to image the colour. Why is this important? You will notice that when you drag certain application icons around the workspace, you can see the background of the workspace within the icon or even through some features of the icon; for example, Icon's icon shows the background around the pencil and through the shadow cast by the pencil. To improve the look of your own icons, it is important for them to have a transparent background. This way, the background of the workspace or a button shows through your icon, hiding the icon's boundary.

Transparent paint is used as follows: in the tool inspector panel there is a pull-down menu of compositing operators such as "copy," "sover" (Source OVER), and "sin" (Source IN). If you were drawing with the pencil tool, it is possible to draw with transparent paint and yet still see the results. This is because the copy compositing operator (the default) ignores transparency. To see which parts of your icon are transparent, as opposed to which parts are simply the same colour as the background, press the 1 key. A scrolling marble background makes it explicit where transparent paint exists. When you are using the selection tool, it is possible to set the compositing operator to "sover," thus making the selection rectangle transparent where there is no image (since the background of a new icon window is transparent by default), making it easier to place a selection.

Detail Tool

The final tool needed for our purposes is the Detail Tool, selected by choosing the "Tools->Detail..." menu item. This tool will bring up a detail window showing a blown-up area of your icon and a detail frame overlaid the original image, indicating which part of your image is showing up in the detail window (see figures 6a and 6b). The detail window can be zoomed, unzoomed, and moved over the original image with the buttons at the top of the detail window.

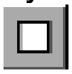
Creating an Icon - a Tutorial

Before we start the tutorial section of this article, some preamble is necessary. Icon has an inconvenient auto-quit feature which selects itself at the most inopportune times. So, save often when working with Icon. Also, set the appropriate bit-plane depth for your machine in Icon’s "Info->Preferences..." panel, which hides itself behind the Tool Inspector. You can set the bit-plane depth with the pull-down menu titled "Buffer Resolution." This would be 2-bit gray for monochrome machines, 16-bit colour for NeXTstation colour machines, and 32-bit colour for NeXTdimension systems. This seems to reduce the frequency with which Icon crashes. However, Icon will run without problems when "Medicine will cure death and government will repeal taxes...", to borrow a quote from the Fall 91 NeXTWORLD. In order to keep Icon core files from chewing up your disk space, which have the nasty habit of hiding in the Icon.app directory, you need to add the following lines to your /etc/rc.local file (see issue 1 of the V-NUS newsletter for details):

```
unlimit coredumpsize
limit coredumpsize 0
```

Now, onward with the tutorial section of our program. There are two ways to create an icon, from scratch or by using and modifying some existing image. I will discuss both approaches.

Creating an Icon From Scratch

The best way to create an application icon from scratch is to load an existing icon, erase it, and then draw your icon. The following information is based on Michael Mahoney's excellent Interface Builder tutorial (available on the archives or from a V-NUS executive) in which he has a small section on creating an application icon. I've added the details of creating an icon with a transparent background. For your icon's template, you can use the icon provided in "/NextDeveloper/Examples/BusyBox/BusyBoxApp.tiff." Open it using the "Image->Open..." menu item. To create a transparent background for your icon and erase the existing icon, select the rectangle tool 
from the Tool Panel, set the opacity to zero in the Colour Panel, and drag out a rectangle over the existing BusyBox icon. You can verify that your new icon's background is transparent by pressing the 1 key. You should see a scrolling marble background in the image window. You can now create your icon with any of the tools in the Tool Panel. Make sure you set the opacity in the Colour Panel back to 100 for opaque lines or some other value if you want to use any transparency effects. To save your icon, use the "Image->Save as..." menu item, ensuring that the transparency or alpha channel of the image is preserved; i.e. the alpha button is enabled.

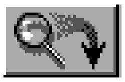
Modifying an Existing Image For Your Icon

In borrowing another image for your icon, either in whole or in part, you need to load the image or part of the image using one of the following menu selections: "Image->Open..." to open an image in a new image window, "Image->Import..." to bring an image into the current image window as a selection, "Image->Grab..." to grab an image from the screen and place it in a new image window, or "Image->Grab Selection..." to grab an image from the screen and place into an existing image window as a selection. As an example, open the image in "/NextLibrary/References/Webster-Dictionary/pictures/apogee.tiff" (figure 7).

Let's say you wanted to use the planet without the orbiting satellite as an application icon. You will need to crop off everything outside the radius of the planet, replace the opaque background with a transparent one, remove the dashed lines over the planet, and then resize it to a 48 x 48 pixel application icon. Before you start, however, you will need to use Icon's grab tool to grab the planet portion of the image and display it in a new image window using the "Image->Grab..." menu item. For some reason the Webster TIFF images are in some format which Icon can load but cannot save. The messages, "TIFF error: NeXT encoding is not implemented," and "AppKit: TIFF error 5" are written to the console (made visible by selecting "Tools->Console" from the Workspace menu).

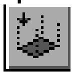
Creating a Transparent Background

You should now have figure 8 as your starting point for manipulating the planet image. You will now replace the opaque background with a transparent one. Use the "Edit->Select All" menu command to place a selection rectangle around the entire image. Now bring up the Colour Panel ("Tools->Colors..."). Click on the magnifying glass in the upper right-hand corner of the Colour Panel,



drag the resulting magnifying glass cursor over to the planet image and click somewhere on the planet's white background. What you have done is pick the background colour and place it in the Colour Panel's colour well (the rectangle underneath the magnifying glass button). Now click-and-drag from the Colour Panel's colour well to the left-most colour well in the Inspector Panel.

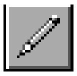
Set the current colour to 0 opacity by sliding the opacity slider all of the way to the left in the Colour Panel. You should see the Colour Panel's colour well change to two rectangles, one white and one black. Now click and drag a colour sample from the Colour Panel's colour well to the right-most colour well in the Inspector Panel. Click the "do it" button underneath this colour well. Now click on the "paste-down" button



in the Inspector Panel for the selection tool (third button from the left, top row in the matrix of buttons representing editing operations). You should now have a transparent background which you can confirm with the scrolling marble background by pressing the 1 key. To get rid of the selection rectangle, simple click on and move the selection slightly to one side, exposing the image underneath the selection. Click anywhere outside of the selection rectangle and it should disappear.

Editing the Image

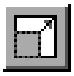
Now bring up the Detail Window ("Tools->Detail..."). Select the pencil tool



from the Tool Panel and ensure that the current colour has 0 opacity (i.e. it’s transparent) in the Colour Panel. You can now edit out the dashed lines around and over the planet in the Detail Window. Remember that you can move the Detail Window over the image by clicking on the arrows at the top of the Detail Window. To restore the crust of the planet where the dashed lines intersected it, select black with an opacity of 100 in the Colour Panel. See figure 9 for the completed image. A word to the wise: save often while you are editing an image! Icon loves to crash just when you’ve finished some tricky editing and especially when you try to save your final image.

Scaling the Image

You will now need to shrink the image to a 48 x 48 pixel image, the standard size for icons in the Workspace. Select the entire image using "Edit->Select All." Enable the coordinate display in the Inspector Panel by clicking on the button labeled "Coordinates." Now click on the scaling button



in the selection tool Inspector Panel (fourth button from the left, second row in the button matrix). The cursor will change to an arrow-tipped cross. Click and drag with the rescaling cursor on one of the corners of the selection rectangle and drag the size of the selection rectangle down to a 48 x 48 pixel square. You should now see a miniature planet inside the selection rectangle superimposed over the original planet image. Crop away anything outside of the selection rectangle using the crop menu function ("Image->Crop"). You now have a 48 x 48 pixel planet icon (see figure 10) which you should save by selecting the "Image->Save" menu item. Ensure that the transparency of the image will be retained by making sure that the Alpha button is labelled "Alpha" and not "No Alpha." Warning! Icon loves to crash at this point, so be prepared to re-do some of your work. How much work depends on if you took my earlier advice seriously or not.

The resizing step is actually optional in creating application icons since the Workspace will re-scale any image which you set as a directory icon or an application icon (using Interface Builder). However, you may want to create an icon of a particular size for another purpose and it is also useful to see how the re-scaled image looks before it shows up in the Workspace. Most images do not rescale very well and may need some additional touch-up after scaling.

Final Words

As I said before, Icon is rather complicated and has a lot of features, most of which I chose to ignore for this article, but it is possible to use it for both useful and straightforward image manipulation. For some advice from the author of Icon, Keith Ohlfs, in designing nice looking icons, see his article, "Designing an Icon," in the Winter 1991 issue if NeXTWORLD.

BIO: Martin works as a NeXT Campus Consultant at the University of British Columbia, is an executive of the Vancouver NeXT Users; Society, and squeezes in graduate studies in Computer Science somewhere inbetween. He also plays guitar and keyboards in a funky dance band and dreams of writing MIDI software for the NeXT. In his spare time he...well, he has no spare time. You may email questions, comments, and redirect to martin@deep.questor.wimsey.bc.ca.